REMARKS

Status of the Claims

This application has been reviewed in light of the Office Action dated June 18, 2004. Claims 1, 3-11, 30-33, 37, and 39-45 are presented for examination. Claims 35, 36, 47, and 48 have been canceled, without prejudice or disclaimer of subject matter. Claims 1, 3, 5, 8, 10, 11, 33, 37, 39, 41, 44, and 45 have been amended to define more clearly what Applicants regard as their invention. Claims 1, 10, 11, 33, 37, and 45 are in independent form. Favorable reconsideration is requested.

Claims 1, 3, 4, 8, 30, 37, 39, 40, and 44 were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,115,157 ("Barnard"). Claim 10 was rejected under 35 U.S.C. § 103(a) as being obvious from U.S. Patent No. 5,619,489 ("Chang"); Claims 5, 6, 41, and 42 as obvious from Barnard in view of Chang; Claim 11 as obvious from Barnard in view of U.S. Patent No. 6,108,113 ("Fee"); Claims 7, 9, and 43 as obvious from Barnard in view of Fee and U.S. Patent No. 6,504,630 ("Czarnocha"); Claims 31 and 32 as obvious from Barnard in view of U.S. Patent No. 5,060,226 ("Gewin"); and Claims 33, 35, 36, 45, 47, and 48 as obvious from U.S. Patent No. 6,452,701 ("Terahara") in view of Fee.

Claim 10

Claim 10 is directed to an optical line terminal. The optical line terminal includes a transponder having a transmitter and a receiver, a test signal generator to generate a test signal (the test signal generator is adapted to selectively output an error frame or a valid frame as the test signal), and a monitoring circuit connected to the receiver

to monitor a bit error rate of a received test signal at an input of the receiver. The optical line transmitter transmits signals applied to an input of the transmitter. The terminal further includes a switch, operable either to couple a signal output by the receiver to the input of the transmitter, or to couple the test signal to the input of the transmitter.

Applicants note that the phrase "from the optical line terminal" has been deleted from Claim 10 to improve clarity.

The features recited in Claim 10 are shown, for example, in Figs. 1 and 2 of the specification. Fig. 1 shows an example of an optical line terminal having two transponders. Fig. 2 shows an example of a switch operable either to couple a signal output by the receiver to the input of the transmitter, or to couple the test signal to the input of the transmitter. Of course, these particular embodiments in no way limit the scope of the claims.

Chang relates to a handheld device for testing high-frequency communication networks. The device may be connected to digital communication lines, e.g., DS0, DS1, DS3, and SONET lines, via a jack on the side of the device. (See Chang at col. 1, lns. 47-53). A DS1 communication signal, for example, operates nominally at 1.544 Mbps and may contain up to 24 DS0 channels (col. 3, lns. 12-15).

The device discussed in Chang transmits and receives high frequency digital communication signals, which are transmitted as <u>electrical</u> signals via a wire, rather than as <u>optical</u> signals. Chang's device does not, and indeed cannot, transmit or receive optical signals.[1] Thus, as the Examiner correctly notes in the Office Action, Chang does not teach

[1] See, e.g., col. 3, lines 16-18, which discusses the conversion of DS1 line coded signals (which are electrical signals) to TTL signals by the T1 receiver. See also, col. 4. lines 5-12, which discusses the conversion of a 51 Mbps STS-1 electrical signal into TTL signals.

or suggest an optical line terminal. *A fortiori*, Chang does not teach or suggest an optical line terminal having the features recited in Claim 10, discussed above.

Chang is characterized in the Office Action as follows:

> Chang et al. do not specifically disclose that the system may be located at an optical line terminal, but they disclose that the system may be used to test operations at various locations in networks, including optical networks (column 1, lines 10-25).

(Office Action at page 5). Thus, Claim 10 recites an optical line terminal, which is an optical device that can be used to form part of an optical network, as opposed to a "system... located at an optical line terminal" or a system used at an optical line terminal, as the claim has been erroneously interpreted in the Office Action. Chang, on the other hand, relates to a hand-held telecommunications tester, which simply is not an optical line terminal. Moreover, Chang's device cannot necessarily be used "at various locations in networks, including optical networks," because Chang's device can only make measurements in optical networks at points that output an electrical signal, e.g., an STS-1 signal.

For at least these reasons, it is respectfully submitted that *prima facie* obviousness has not been established with respect to Claim 10, and Applicants respectfully request withdrawal of that rejection.[2]

[2] "To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art." MPEP § 2143.03 (citing *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974)). "All words in a claim must be considered in judging the patentability of that claim against the prior art." MPEP § 2143.03 (quoting *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970)).

Claim 11

Claim 11, as amended, is directed to a wavelength division multiplexed optical system. The system includes an optical node with a transponder having a test signal generator to generate a test signal, the test signal generator being adapted to generate the test signal by selectively outputting an error frame or a valid frame as the test signal. Client equipment is provided including a monitoring circuit to monitor a received test signal. The system further includes an optical path through which at least optical communications normally are exchanged between the optical node and the client equipment. The optical path is tested by monitoring a bit error rate of the test signal generated by the test signal generator of the optical node and received by the monitoring circuit of the client equipment through the optical path.

Barnard relates to a method of equalizing the channels of a wavelength division multiplexed link by measuring bit error rate (BER) in each channel and using the BER to determine signal attenuation. The transmitter powers are adjusted based on the determined signal attenuation.

Nothing has been found in Barnard that teaches or suggests an optical node with a transponder having a test signal generator adapted to generate the test signal by selectively outputting an error frame or a valid frame as the test signal, as recited in Claim 11. Figure 2B of Barnard, cited in the Office Action, shows a block diagram of an optical transmitter, but this unit does not selectively output an error frame or a valid frame, as claimed.

It is asserted in the Office Action that "a generator is not explicitly shown in figures, but Barnard et al. specifically disclose generating a frame as a test signal at the

transmitter by some other means." (Office Action at page 6). However, it is clear that there is no such test signal generator in the transmitter shown in Fig. 2B, which is cited as corresponding to the claimed transponder. Indeed, if Barnard's device had a test signal generator, it would be located outside of the transmitter, because the transmitter merely takes input signal S_1 and feeds it to a modulator. (See Barnard at Fig. 2B and col. 5, lines 29-33).

Fee, which relates to a system for carrying ancillary network data using a sub-carrier modulation signal, is cited as purportedly disclosing the use of client equipment. But even assuming, *arguendo*, that one of ordinary skill in the art would have been motivated to combine Fee with Barnard, the resulting combination still would not teach or suggest a transponder having a test signal generator adapted to generate the test signal by selectively outputting an error frame or a valid frame as the test signal, as recited in Claim 11.

Moreover, nothing has been found or pointed out in this combination of references that would teach or suggest that the optical path is tested by monitoring a bit error rate of the test signal received by the monitoring circuit of the client equipment through the optical path. The Examiner makes the unsupported assertion that Barnard discloses "monitoring a test signal at a second location connected to the optical node," but this characterization of the teachings of the reference is too broad, in Applicants' view. Barnard actually detects the bit error rate using receivers at a terminal (17). (See Barnard at col. 6, lines 9-13). The Examiner has not explained why one of ordinary skill in the art would have been motivated to move this bit error rate detection function from Barnard's receiver to Fee's device, if this hypothesized combination were to be made.

Finally, it is respectfully submitted that the Examiner's rationale for combining Barnard and Fee, "in order to provide well known interfaces for users in the network so that those users may communicate with each other," is too vague to rise to the level of a "convincing line of reasoning."[3]

Claims 1, 8, 37, and 44

Claim 37, as amended, is directed to a method for operating a wavelength division multiplexed optical communication system. A test signal is generated by selectively outputting an error frame or a valid frame. The generated test signal is transmitted from a first optical node to a second optical node by way of a light path through which at least optical communications normally are exchanged between the first and second optical nodes. It is determined whether there is a fault condition in the light path based on a bit error rate of the test signal received at the second optical node.

Nothing has been found in Barnard that would teach or suggest generating a test signal by selectively outputting an error frame or a valid frame, as recited in Claim 37. With respect to Barnard's test signal, the Examiner cites column 5, lines 7-16 and lines 29-33. However, these portions merely describe the use of a "control code" or a SONET frame as a test signal, rather than the selection of an error frame or a valid frame, as claimed.

[3] "To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." MPEP §2142 (quoting *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985).

Moreover, Applicants note that nothing has been found or pointed out in Barnard that teaches or suggests determining whether there is a fault condition in the light path based on a bit error rate of the test signal received at the second optical node, as recited in Claim 37. The Examiner points to col. 6, lines 15-28 of Barnard in this regard. However this cited portion merely describes the measurement of the bit error rate at the receiver to equalize the two communication channels, i.e., to adjust the relative gain between the two channels, rather than to detect a fault condition. Thus, Barnard is not believed to have disclosed all of the features Claim 37, even prior to the amendment of that claim herein.

Accordingly Claim 37 is believed to be patentable over Barnard.

Independent Claim 1 recites features similar to those discussed above with respect to Claim 37 (although it is not necessarily identical in scope) and therefore is also believed to be patentable over Barnard for the reasons discussed above. Specifically, Claim 1 recites that the test signal generator is adapted to generate the test signal by selectively outputting an error frame or a valid frame.

Claim 44, which depends from Claim 37, has also rejected based on Barnard. The Examiner, without citing anything specific in the reference, states: "Barnard et al. disclose that the test signal includes predetermined errors (i.e., errors which are noted and measured at the second node)." But this strained reasoning seems to ignore the term "predetermined," resulting in an improper interpretation of the claim.[4] It therefore is

[4] While anticipation is not an *ipsissimis verbis* test, it is well-established that "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." MPEP § 2131 (quoting *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987))(emphasis added).

respectfully submitted that the Examiner has not found in Barnard the "identical invention" of Claim 44.[5] Accordingly, Claim 44 is believed to be patentable over Barnard.

Claim 8, which depends from Claim 1, recites features similar to those discussed above with respect to Claim 44 (although it is not necessarily identical in scope) and therefore is also believed to be patentable over Barnard for the reasons discussed above.

Claims 33 and 45

Claim 33 is directed to a wavelength division multiplexed optical communication system having an optical path through which optical communications normally are communicated. The system includes at least one optical node having a transmitting portion, arranged to transmit a generated optical test signal through the optical path. The at least one optical node further includes a receiving portion, arranged to receive the test signal from the transmitting portion through the optical path, and to monitor a quality of the test signal received through the optical path by measuring a bit error rate. The optical path includes at least one other optical node having a loopback mechanism, which directs the generated test signal transmitted by the transmitting portion towards the receiving portion, without requiring a conversion of the test signal to or from a non-optical form outside of the optical node. The at least one optical node further includes an add-drop multiplexer.

[5] "The identical invention must be shown in as complete detail as is contained in the ... claim." MPEP § 2131 (quoting *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989)).

Terahara relates to a supervisory system in a wavelength division multiplexing communications network. In this system, a first terminal station transmits a supervisory signal to a second terminal station. The supervisory signal can be looped-back at the second terminal or at a branch terminal between the two terminals.

Claim 36, which has been cancelled herein, was also rejected based on Terahara. The Examiner asserts that: "Terahara et al. disclose that the at least one other optical node includes an add-drop multiplexer. Figure 9C shows an add drop multiplexer...that may be understood as a part of a node that also includes hub station B." (Office Action at page 11). But Figures 9A and 9C both clearly show that the optical wavelength multiplexing unit (10) is not part of Hub Station B. Moreover, the Examiner fails to explain why one of ordinary skill the art would have been motivated to make such a modification to Terahara and seems to be relying improperly on Applicants' disclosure "as a blueprint for piecing together the prior art to defeat patentability."[6] It therefore is respectfully submitted that *prima facie* obviousness has not been established with respect to the subject matter of Claim 36.

Claim 33 has been amended to incorporate the subject matter of Claim 36 and intervening Claim 35. Accordingly, Claim 33 is believed to be patentable over Terahara.

Independent Claim 45, which has been amended to include the subject matter of cancelled Claims 47 and 48, recites features similar to those discussed above with

[6] "Our case law makes clear that the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references....Combining prior art references without evidence of such a suggestion, teaching, or motivation simply takes the inventor's disclosure as a blueprint for piecing together the prior art to defeat patentability--the essence of hindsight." *In re Dembiczak*, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999).

respect to Claim 33 (although it is not necessarily identical in scope), and therefore, Claim 45 is also believed to be patentable over Terahara for the reasons discussed above.

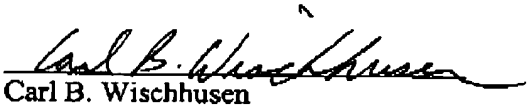
A review of the other art of record, including Czarnocha and Gewin, has failed to reveal anything which, in Applicants' opinion, would remedy the deficiencies of the art discussed above, as references against the independent claims herein. Those claims are therefore believed patentable over the art of record.

The other claims in this application are each dependent from one or another of the independent claims discussed above and are therefore believed patentable for the same reasons. Since each dependent claim is also deemed to define an additional aspect of the invention, however, the individual reconsideration of the patentability of each on its own merits is respectfully requested.

In view of the foregoing, Applicants respectfully request favorable reconsideration and early passage to issue of the present application.

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,



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